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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/731,789	12/08/2000	Hideyo Okushi	200547US2	1445
22850	7590	10/07/2003	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			DOAN, THERESA T	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/731,789

Applicant(s)

OKUSHI ET AL.

Examiner

Theresa T Doan

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 09/05/03 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 07-307487 (Koji et al.) of record.

Regarding claim 1, Koji et al. teach diamond semiconductor having an exciton light-emission intensity characteristic, the diamond semiconductor being fabricated using a raw gas including a methane gas and a hydrogen gas in a microwave plasma chemical vapor deposition method, in which the methane gas has a concentration of not more than 2.0% (see paragraphs [0054], [0055]).

Koji et al. do not explicitly disclose that diamond semiconductor having an exciton light-emission intensity characteristic that varies nonlinearly. However, it has been held that where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, claimed properties or functions are presumed to be inherent. In re Best, 195 USPQ 430, 433 (CCPA 1977). In this case, because the claimed product is substantially identical to Koji et al.'s product and the claimed product is produced by substantially identical process (i.e., being fabricated using a raw gas including a methane gas and a hydrogen gas in a microwave plasma chemical vapor deposition method); therefore, the diamond semiconductor of Koji et al. that having an exciton light-emission intensity characteristic would inherently have varies nonlinearly.

Regarding claims 2-4, Koji et al. teach that the exciton light emission is due to electron beam injection and having an optical wavelength of not more than 300nm (see pages 2-3).

Regarding claim 5, Koji et al. teach the diamond semiconductor is of high quality sufficient to emit ultraviolet light at room temperature in response to energy injection (see pages 3-4).

Regarding claim 6, Koji et al. teach the diamond semiconductor is an epitaxial diamond thin film obtained by diamond synthesis by means of a microwave plasma CVD method (see page 6).

Regarding the processing limitations recited in claims 1 and 6 (an epitaxial diamond thin film obtained by diamond synthesis by means of a microwave plasma CVD method), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

4. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by The Highest Carrier Mobility in the World of Diamond Thin Films, Hideyo Okushi et al., AFM Image, 1999.

Regarding claim 1, Okushi et al. teach diamond semiconductor having an exciton light-emission intensity characteristic, the diamond semiconductor being fabricated using a raw gas including a methane gas and a hydrogen gas in a microwave plasma chemical vapor deposition method, in which the methane gas has a concentration of not more than 2.0% (see pages 5-6).

Okushi et al. do not explicitly disclose that diamond semiconductor having an exciton light-emission intensity characteristic that varies nonlinearly. However, it has been held that where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, claimed properties or functions are presumed to be inherent. In re Best, 195 USPQ 430, 433 (CCPA 1977). In this case, because the claimed product is substantially identical to Okushi et al.'s product and the claimed product is produced by substantially identical process (i.e., being fabricated using a raw gas including a methane gas and a hydrogen gas in a microwave plasma chemical vapor deposition method); therefore, the diamond semiconductor of Okushi et al. that having an exciton light-emission intensity characteristic would inherently have varies nonlinearly.

Regarding claims 2 and 4, Okushi et al. teach that the exciton light emission is due to electron beam injection and the exciton light emission intensity increases rapidly in response to an electron beam above a threshold value (see pages 6-7).

Regarding claim 5, Okushi et al. teach the diamond semiconductor is of high quality sufficient to emit ultraviolet light at room temperature in response to energy injection (see page 7).

Regarding claim 6, Okushi et al. teach the diamond semiconductor is an epitaxial diamond thin film obtained by diamond synthesis by means of a microwave plasma CVD method (see pages 5-7).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T Doan whose telephone number is (703) 305-2366. The examiner can normally be reached on Monday to Thursday from 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TD
September 30, 2003.


PHAT X. CAO
PRIMARY EXAMINER